UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/567,221	02/03/2006	Babak Movassaghi	DE 030290	9537

24737 7590 07/10/2008

PHILIPS INTELLECTUAL PROPERTY & STANDARDS
P.O. BOX 3001
BRIARCLIFF MANOR, NY 10510

EXAMINER	
RUSH, ERIC	
ART UNIT	PAPER NUMBER
2624	
MAIL DATE	DELIVERY MODE
07/10/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/567,221	MOVASSAGHI ET AL.	
	Examiner	Art Unit	
	ERIC RUSH	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 February 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 February 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

This action is responsive to the amendment and remarks received on 2/21/08. Claims 1 – 20 are currently pending.

Claim Objections

1. The objection to claims 1 and 10 are withdrawn in view of the amendments and remarks received 2/21/08.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. The claim rejections under 35 U.S.C. 112 second paragraph of claims 4-6 are withdrawn in view of the amendment and remarks received on 2/21/08.

Claim Rejections - 35 USC § 102

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 1 – 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Kenneth R. Hoffmann, Andreas Wahle, Claire Pello-Barakat, Jack Sklansky & Milan

Sonka, "Biplane X-ray Angiograms, Intravascular Ultrasound, and 3D Visualization of Coronary Vessels" International Journal of Cardiac imaging, Dordrecht, NL, Vol. 15 No. 6 Dec. 1999 Pertinent Pages 495 - 512.

- With regards to claim 1, Hoffmann et al. teach a device for generating a three-dimensional model of a spatial structure comprising: an imaging unit for generating two-dimensional projection images of the structure from various directions; (Hoffman et al., Page 496 Column 1 Lines 4 - 8) a display unit that is coupled to the imaging unit for displaying one of the projection images as a reference image, in which connection the display unit comprises input means in order to make possible the interactive specification of at least one image point of the structure as a reference point; (Hoffmann et al., Page 498 Column 1 Lines 25 - 42) a data processing device that is coupled to the imaging unit and the display unit and is designed to reconstruct a space point corresponding to the reference point of the structure from further projection images produced from other direction using the image-processing unit, (Hoffmann et al., Page 498 Column 2 Lines 27 - 35) wherein the space point is reconstructed by evaluating other image points of the further projection images that lie on a respective epipolar line of the reference point, (Hoffmann et al., Page 496 Column 2 Lines 12 - 19 and Lines 35 - 41, Page 497 Column 2 Lines 5 – 20 and Lines 30 – 49, and Page 498

Column 3 Lines 1 – 6 and Column 3 Line 20 – Column 4 Line 35) and wherein gray scale values corresponding to the other image points are projected on a projection line of the reference point and added to form a sum profile. (Hoffmann et al., Fig. 3, Page 499 Column 2 Lines 7 – 18 and Page 496 Lines 26 - 35)

- With regards to claim 2, Hoffmann et al. teach a device as claimed in claim 1, wherein the imaging unit is a rotation X-ray unit. (Hoffmann et al., Page 496 Column 1 Lines 4 - 8)

- With regards to claim 3, Hoffmann et al. teach a device as claimed in claim 1, wherein the data-processing device is designed to reconstruct said space point utilizing further projection images that are obtained during different cardiac phases. (Hoffmann et al., Page 503 Lines 31 - 40)

- With regards to claim 4, Hoffmann et al. teach a device as claimed in claim 3, wherein the gray scale values are added punctiformly to form the sum profile. (Hoffmann et al., Fig. 3, Page 499 Column 2 Lines 7 – 18)

- With regards to claim 5, a device as claimed in claim 1, wherein the sum profile is only evaluated in a segment in which gray scale values of all the

further projection images have contributed to the sum profile. (Hoffmann et al., Fig. 3, Page 499 Column 2 Lines 7 – 18)

- With regards to claim 6, Hoffmann et al. teach a device according to claim 1, wherein said space point is defined as that position on the projection line of the reference point at which the sum profile assumes an extreme. (Hoffmann et al., Fig. 3, Page 499 Column 1 Line 22 – Column 2 Line 18 and Page 500 Column 1 Line 8 – Column 2 Line 26)

- With regards to claim 7, Hoffmann et al. teach a device as claimed in claim 1, wherein the spatial structure has a linear route and the data-processing device is designed to reconstruct said linear route from a specification of a plurality of reference points situated on the reference image. (Hoffmann et al., Fig. 3, Page 499 Column 1 Line 22 – Column 2 Line 18 and Page 500 Column 1 Line 8 – Column 2 Line 26, Page 498 Column 3 Lines 1 – 6 and Column 3 Line 20 – Column 4 Line 35)

- With regards to claim 8, Hoffmann et al. teach a device as claimed in claim 1, wherein the data-processing device is designed to determine a width of the spatial structure from a projection of a reconstructed three-dimensional model on projection images of the spatial structure.

(Hoffmann et al., Page 498 Column 2 Lines 27 – 35, Page 506 Column 1 Lines 1 – 6, and Page 508 Column 1 Lines 37 - 46)

- With regards to claim 9, Hoffmann et al. teach a device as claimed in claim 1, further comprising: a cyclic movement detector for determining spontaneous movement associated with the spatial structure, (Hoffmann et al., Page 503 Column 2 Lines 6 – 40 and Page 504 “Extraction of the catheter path” section) wherein the data-processing device is designed to use only those further projection images for the reconstruction of the space point that originate from the same phase of the spontaneous movement as the reference image. (Hoffmann et al., Page 503 Column 2 Lines 6 – 40 and Page 504 “Extraction of the catheter path” section)

- With regards to claim 10, Hoffmann et al. teach a method for generating a three-dimensional model of a spatial structure comprising the following steps: generating two-dimensional projection images of the structure taken from different directions, (Hoffman et al., Page 496 Column 1 Lines 4 - 8) the images comprising a reference image and further projection images; (Hoffmann et al., Page 498 Column 1 Lines 25 - 42) displaying the reference image; (Hoffmann et al., Page 498 Column 1 Lines 25 - 42) obtaining a selection of at least one image point on the reference image of the spatial structure as a reference point; (Hoffmann et al., Page 498

Column 2 Lines 27 - 35) determining a space point corresponding to the reference point of the spatial structure from the further projection images, wherein the space point is determined based on image intensity of other image points of the further projection images that lie on a respective epipolar line of the reference point. (Hoffmann et al., Fig. 3, Page 496 Column 2 Lines 12 - 19 and Lines 35 - 41, Page 497 Column 2 Lines 5 – 20 and Lines 30 – 49, Page 498 Column 3 Lines 1 – 6 and Column 3 Line 20 – Column 4 Line 35 and Page 499 Column 2 Lines 7 – 18)

- With regards to claim 11, Hoffmann et al. teach the method of claim 10, wherein gray scale values corresponding to the other image points are projected on a projection line of the reference point and added to form a sum profile for determining the space point. (Hoffmann et al., Fig. 3, Page 499 Column 2 Lines 7 – 18 and Page 496 Lines 26 - 35)

- With regards to claim 12, Hoffmann et al. teach the method of claim 10, further comprising obtaining the two-dimensional projection images using a rotation X-ray unit. (Hoffmann et al., Page 496 Column 1 Lines 4 - 8)

- With regards to claim 13, Hoffmann et al. teach the method of claim 10, wherein the space point is reconstructed utilizing further projection images

that are obtained during different cardiac phases. (Hoffmann et al., Page 503 Lines 31 - 40)

- With regards to claim 14, Hoffmann et al. teach the method of claim 11, wherein the gray scale values are added punctiformly to form the sum profile. (Hoffmann et al., Fig. 3, Page 499 Column 2 Lines 7 – 18)

- With regards to claim 15, Hoffmann et al. teach the method of claim 11, wherein the sum profile is only evaluated in a segment in which gray scale values of all the further projection images have contributed to the sum profile. (Hoffmann et al., Fig. 3, Page 499 Column 2 Lines 7 – 18)

- With regards to claim 16, Hoffmann et al. teach the method of claim 11, wherein the space point is defined as that position on the projection line of the reference point at which the sum profile assumes an extreme. (Hoffmann et al., Fig. 3, Page 499 Column 1 Line 22 – Column 2 Line 18 and Page 500 Column 1 Line 8 – Column 2 Line 26)

- With regards to claim 17, Hoffmann et al. teach the method of claim 11, wherein the spatial structure has a linear route and is reconstructed from a specification of a plurality of reference points situated on the reference image. (Hoffmann et al., Fig. 3, Page 499 Column 1 Line 22 – Column 2

Line 18 and Page 500 Column 1 Line 8 – Column 2 Line 26, Page 498 Column 3 Lines 1 – 6 and Column 3 Line 20 – Column 4 Line 35)

- With regards to claim 18, Hoffmann et al. teach the method of claim 11, further comprising determining a width of the spatial structure from a projection of a reconstructed three-dimensional model on projection images of the spatial structure. (Hoffmann et al., Page 498 Column 2 Lines 27 – 35, Page 506 Column 1 Lines 1 – 6, and Page 508 Column 1 Lines 37 - 46)

- With regards to claim 19, Hoffmann et al. teach the method of claim 11, further comprising: determining spontaneous movement associated with the spatial structure using an electrocardiograph apparatus, (Hoffmann et al., Page 503 Column 2 Lines 6 – 40 and Page 504 "Extraction of the catheter path" section) and wherein only those further projection images are utilized for the reconstruction of the space point that originate from the same phase of the spontaneous movement as the reference image. (Hoffmann et al., Page 503 Column 2 Lines 6 – 40 and Page 504 "Extraction of the catheter path" section)

- With regards to claim 20, Hoffmann et al. teach a computer-readable storage medium comprising computer instructions for: (Hoffmann et al.,

Page 496 Column 1 Lines 5 – 29, specifically Lines 15 – 19) obtaining two-dimensional projection images of a spatial structure taken from different directions, (Hoffman et al., Page 496 Column 1 Lines 4 - 8) the images comprising a reference image and further projection images; (Hoffmann et al., Page 498 Column 1 Lines 25 - 42) displaying the reference image; (Hoffmann et al., Page 498 Column 1 Lines 25 - 42) obtaining a selection of a reference point on the reference image; (Hoffmann et al., Page 498 Column 2 Lines 27 - 35) determining epipolar lines for at least a portion of the further projection images, the epipolar lines being based on the reference point; (Hoffmann et al., Page 496 Column 2 Lines 12 - 19 and Lines 35 - 41, Page 497 Column 2 Lines 5 – 20 and Lines 30 – 49, and Page 498 Column 3 Lines 1 – 6 and Column 3 Line 20 – Column 4 Line 35) determining image intensity of image points of the further projection images that lie on the epipolar lines; (Hoffmann et al., Fig. 3, Page 496 Column 2 Lines 12 - 19 and Lines 35 - 41, Page 497 Column 2 Lines 5 – 20 and Lines 30 – 49, Page 498 Column 3 Lines 1 – 6 and Column 3 Line 20 – Column 4 Line 35 and Page 499 Column 2 Lines 7 – 18) determining a space point corresponding to the reference point of the spatial structure from a summation of a least a portion of the image intensities; (Hoffmann et al., Fig. 3, Page 496 Column 2 Lines 12 - 19 and Lines 35 - 41, Page 497 Column 2 Lines 5 – 20 and Lines 30 – 49, Page 498 Column 3 Lines 1 – 6 and Column 3 Line 20 – Column 4 Line 35 and

Page 499 Column 2 Lines 7 – 18) and generating a three-dimensional model of the spatial structure using the space point. (Hoffmann et al., Page 498 Column 2 Lines 27 – 35, Page 506 Column 1 Lines 1 – 6, and Page 508 Column 1 Lines 37 - 46)

Response to Arguments

6. Applicant's arguments with respect to claims 1- 20 have been considered but are moot in view of the new ground(s) of rejection.

7. Applicant's arguments filed 02/21/2008 have been fully considered but they are not persuasive. On page 8 of the remarks, Applicant's Representative argues that Hoffmann et al. fail to teach “the space point being reconstructed by evaluating other image points of the further projection images that lie on a respective epipolar line of the reference point” and “the gray scale values corresponding to the other image points being projected on a projection line of the reference point and added to form a sum profile". The Examiner respectfully disagrees and directs the Applicant’s Representative’s attention to Page 496 Column 2 Lines 12 - 19 and Lines 35 - 41, Page 497 Column 2 Lines 5 – 20 and Lines 30 – 49, and Page 498 Column 3 Lines 1 – 6 and Column 3 Line 20 – Column 4 Line 35 of Hoffman et al. which discloses “the space point being reconstructed by evaluating other image points of the further projection images that lie on a respective epipolar line of the reference point”. Hoffmann et al. do in fact teach “the space point being reconstructed by evaluating other image points of the further projection images that lie on a respective epipolar line of the reference point”

in the previously cited sections. Hoffmann et al. also disclose "gray scale values corresponding to the other image points being projected on a projection line of the reference point and added to form a sum profile" see, Fig. 3, Page 499 Column 2 Lines 7 – 18 and Page 496 Lines 26 – 35 of Hoffmann et al.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ERIC RUSH whose telephone number is (571)270-3017. The examiner can normally be reached on 7:30AM - 5:00PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Samir Ahmed can be reached on (571) 272-7413. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ER
/Samir A. Ahmed/
Supervisory Patent Examiner, Art Unit 2624